

Week 10: Capstone Project Part 3.2_Salman_NUS

Replicate did not work,hence I am using Hugging Face for image models

```
!pip install diffusers transformers accelerate torch --quiet
```

```
363.4/363.4 MB 2.8 MB/s eta 0:00:00
13.8/13.8 MB 43.9 MB/s eta 0:00:00
24.6/24.6 MB 31.1 MB/s eta 0:00:00
883.7/883.7 kB 42.1 MB/s eta 0:00:00
664.8/664.8 MB 837.5 kB/s eta 0:00:00
211.5/211.5 MB 4.4 MB/s eta 0:00:00
56.3/56.3 MB 11.7 MB/s eta 0:00:00
127.9/127.9 MB 7.4 MB/s eta 0:00:00
287.5/287.5 MB 5.0 MB/s eta 0:00:00
21.1/21.1 MB 84.5 MB/s eta 0:00:00
```

```
from huggingface_hub import login
login(token= "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")
```

```
from diffusers import StableDiffusionPipeline
import torch
```

```
# 1. Load the model
pipe = StableDiffusionPipeline.from_pretrained(
    "runwayml/stable-diffusion-v1-5", # a well-known free model
    torch_dtype=torch.float16,
).to("cuda" if torch.cuda.is_available() else "cpu")
```

```
# 2. Define your prompts
prompts = [
    "a white siamese cat, studio lighting",
    "a white siamese cat, dramatic lighting, dark background",
    "a white siamese cat, outdoor setting, natural light"
]
```

```
generator = torch.manual_seed(42)
```

```
# 3. Generate and save images
for i, prompt in enumerate(prompts, 1):
```

```
    image = pipe(prompt, num_inference_steps=30, guidance_scale=7.5).images[0]
    filename = f"siamese_cat_{i}.png"
    image.save(filename)
    print(f" Generated '{filename}' for prompt: '{prompt}'")
```

```
>Loading pipeline components...: 100%
```

7/7 [00:22<00:00, 3.93s/it]

```
100% 30/30 [00:04<00:00, 6.65i/s]
✓ Generated 'siamese_cat_1.png' for prompt: "a white siamese cat, studio lighting"
100% 30/30 [00:04<00:00, 6.48i/s]
✓ Generated 'siamese_cat_2.png' for prompt: "a white siamese cat, dramatic lighting, dark background"
100% 30/30 [00:04<00:00, 6.35i/s]
✓ Generated 'siamese_cat_3.png' for prompt: "a white siamese cat, outdoor setting, natural light"
```

```
from google.colab import files
```

```
# Download each generated image
files.download("siamese_cat_1.png")
files.download("siamese_cat_2.png")
files.download("siamese_cat_3.png")
```

```
>Loading pipeline components...: 100%
```

```
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import torch
```

```
# 1. Load the model
pipe = StableDiffusionPipeline.from_pretrained(
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# 2. Define your prompts
prompts = [
    "a white siamese cat, studio lighting",
    "a white siamese cat, dramatic lighting, dark background",
    "a white siamese cat, outdoor setting, natural light"
]
```

```
generator = torch.manual_seed(50)
```

```
# 3. Generate and save images
for i, prompt in enumerate(prompts, 1):
```

```
    image = pipe(prompt, num_inference_steps=40, guidance_scale=7.5).images[0]
    filename = f"siamese_cat_{i}.png"
    image.save(filename)
    print(f" Generated '{filename}' for prompt: '{prompt}'")
```

```
>Loading pipeline components...: 100%
```

7/7 [00:22<00:00, 3.98s/it]

```
100% 40/40 [00:06<00:00, 6.86i/s]
✓ Generated 'siamese_cat_1.png' for prompt: "a white siamese cat, studio lighting"
100% 40/40 [00:06<00:00, 6.67i/s]
✓ Generated 'siamese_cat_2.png' for prompt: "a white siamese cat, dramatic lighting, dark background"
100% 40/40 [00:06<00:00, 6.53i/s]
✓ Generated 'siamese_cat_3.png' for prompt: "a white siamese cat, outdoor setting, natural light"
```

```
from google.colab import files
```

```
# Download each generated image
files.download("siamese_cat_1.png")
files.download("siamese_cat_2.png")
files.download("siamese_cat_3.png")
```

```
Observations
```

Steps Visual Quality Detail Sharpness Noise Time Taken
30 Moderate Basic shapes visible Some visible noise Fast
40 Good improvement Better textures Less noise Slower

Feature Seed 42 Seed 50
Pose Cat sitting upright, facing forward Cat slightly turned or lying down
Facial Expression Neutral or calm Playful or more expressive
Lighting Style Even studio lighting Subtle contrast with shadows
Background Clean, white or studio backdrop Slightly textured or off-white tones
Color & Texture Pure white fur, slightly warm tones Slight blue-tint in shadows

Observations

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Better textures Less noise Slower

Feature Seed 42 Seed 50 Pose Cat sitting upright, facing forward Cat slightly turned or lying down Facial Expression Neutral or calm Playful or more expressive Lighting Style Even studio lighting Subtle contrast with shadows Background Clean, white or studio backdrop Slightly textured or off-white tones Color & Texture Pure white fur, slightly warm tones Slight blue-tint in shadows